IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :

GOTTLIEB-GEORG LINDNER, ET AL. : EXAMINER: NGUYEN

SERIAL NO: 10/079,479 :

FILED: FEBRUARY 22, 2002 : GROUP ART UNIT: 1754

FOR: SILICA BY PRECIPITATION AT CONSTANT ALKALI NUMBER, AND ITS USE

APPEAL BRIEF

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

This is an appeal from the Examiner's Final Rejection dated September 13, 2005, of Claims 1, 4, 5, 10-12, 14-19 and 22-25. A Notice of Appeal is filed herewith.

I. REAL PARTY IN INTEREST

The real party in interest is Degussa AG of Duesseldorf, Germany, by virtue of the assignment recorded June 13, 2002, at Reel/Frame 012987/0115.

II. RELATED APPEALS AND INTERFERENCES

Appellants wish to draw attention to the fact that an Appeal Brief was filed on December 16, 2005, in the Divisional application of this case: Serial No. 11/045,122.

III. STATUS OF THE CLAIMS

The appealed claims are Claims 1, 4, 5, 10-12, 14-19 and 22-25.

IV. STATUS OF THE AMENDMENT

No Amendment under 37 C.F.R. §1.116 was filed.

V. SUMMARY OF THE OF THE CLAIMED SUBJECT MATTER

As claimed in **Claim 1**, the present application relates to a precipitated silica having the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

See page 4, 1st paragraph, of the specification.

As claimed in **Claim 10**, the present invention also relates to a process for preparing precipitated silica, comprising:

simultaneously metering into an aqueous silicate solution more aqueous silicate solution and a Lewis and/or Brønsted acid to provide a mixture,

acidifying the mixture to a pH of 7-3.0 to provide an acidified mixture,

optionally filtering the acidified mixture to obtain a filtered precipitated silica,

optionally drying the filtered precipitated silica,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 1, and

wherein said silica has the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

See page 2, lines 7-16 and page 4, 1st paragraph, of the specification.

As claimed in **Claim 17**, the present invention relates to a process for preparing precipitated silica, comprising:

simultaneously metering into a vessel an aqueous silicate solution and a Lewis and/or Brønsted acid to provide a mixture,

acidifying the mixture to a pH of 7-3 to provide an acidified mixture,

optionally filtering the acidified mixture to obtain a filtered precipitated silica,

optionally drying the filtered precipitated silica,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 1, and wherein said silica has the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);

CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

See page 2, lines 7-16 and page 4, 1st paragraph, of the specification.

VI. GROUNDS OF REJECTION

(A) Claims 1, 4-5, 10-12, 14-19 stand rejected under 35 U.S.C. §103 (a) over Chevallier (US 6, 107,226).

VII. ARGUMENT

Ground (A)

Claims 1, 4-5, 10-12, 14-19 and 22-25 stand rejected under 35 U.S.C. §103 (a) over Chevallier (US 6, 107,226). That rejection is untenable and should not be sustained.

Claim 1

The present invention as set forth in **Claim 1** relates to a precipitated silica having the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

Claims 4, 5, 14, 15 and 16 depend on Claim 1.

In contrast, the product of Chevallier cannot have the claimed choline chloride absorption and the ratio of DBP/choline chloride absorption.

As discussed at page 1, last paragraph of the specification of the present invention:

> The known silicas generally do not possess pronounced sorption characteristics for polar compounds. Since silicas are frequently used as carrier material for polar compounds such as choline chloride, propionic acid or formic acid, for example, it is an object of the present invention to provide a silica which possesses particularly good sorbency for polar compounds.

In other words, conventional silicas do not have a good sorption for polar compounds and the claimed choline chloride absorption is a measure of the sorbency for polar compounds.

The specification further discloses at page 2, 1st paragraph:

> It has surprisingly been found that by preparing the precipitated silicas at a constant alkali number, products can be obtained which have good sorption characteristics for polar compounds.

However, contrary to the Examiners' assertion (Office Action of September 13, 2005, page 4, last paragraph), the silicas of Chevallier are not prepared at constant alkali number but at constant pH. See col. 5, lines 5-9:

> The simultaneous introduction of the acid and the silicate was carried out in a manner such that the pH of the reaction medium during this period was equal to 7.5±0.1.

Such constant pH process is known and results in conventional materials which lack the sorbency for polar compound and thus lack the claimed choline chloride absorption. See page 3, lines 5-8 of the specification.

The Examiner further argues that the DOP uptake (oil uptake) of the silicas of Chevallier is similar to the DBP absorption of the present invention (Office Action of September 13, 2005, page 4, last paragraph). She further concludes that it follows that the silicas of Chevallier have the same choline chloride absorption as claimed. However, DOP uptake characterizes oil uptake and DBP absorption characterizes the absorption for nonpolar compounds in general. Chevallier does not establish that a certain DOP uptake or DBP absorption are linked to a certain value of choline chloride absorption. Just because a compound has a certain oil uptake characteristic (DOP of Chevallier) it does not mean that the same compound inherently has a certain

absorbency for polar compounds (specification, page 4, lines 10-15). In fact a material may absorb non-polar materials to a certain degree and may not have any absorbency for polar compounds. Chevallier is only interested in oil uptake and not absorption of polar compounds. In addition, the Examiner has not provided a reference which establishes the relationship between absorbency for polar compounds and the absorbency for non-polar compounds. Rather, in view of the fact that the silicas of Chevallier are made by a conventional pH constant process, it follows that they do not have a good absorbency for polar compounds because it is known that such process result in compounds having poor absorbency for polar compounds, and thus the silicas of Chevallier cannot have the claimed choline chloride absorption or the claimed ratio of DBP/choline chloride absorption.

THE PROCESS CLAIMS

Claim 10

Claim 10 relates to a process for preparing precipitated silica, comprising:

simultaneously metering into an aqueous silicate solution more aqueous silicate solution and a Lewis and/or Brønsted acid to provide a mixture,

acidifying the mixture to a pH of 7-3.0 to provide an acidified mixture,

optionally filtering the acidified mixture to obtain a filtered precipitated silica,

optionally drying the filtered precipitated silica,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 1, and

wherein said silica has the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

Claims 11, 12, 22 and 23 depend on Claim 10.

Claim 17

Claim 17 relates to a process for preparing precipitated silica, comprising:

simultaneously metering into a vessel an aqueous silicate solution and a Lewis and/or Brønsted acid to provide a mixture,

acidifying the mixture to a pH of 7-3 to provide an acidified mixture,

optionally filtering the acidified mixture to obtain a filtered precipitated silica,

optionally drying the filtered precipitated silica,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 1, and wherein said silica has the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

Claims 18, 19, 24 and 25 depend on Claim 17.

In contrast, Chevallier fails to disclose or suggest the claimed process in which the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining **a constant alkali number in the mixture of at least 1**. In addition, Chevallier fails to disclose or suggest that such process results in silica having the claimed choline chloride absorption and the ratio of DBP/choline chloride absorption.

The Examiner asserts that precipitation of Chevallier proceeds at constant alkali number (Office Action of September 13, 2005, page 4, 4th paragraph). Applicants disagree.

The specification discloses that "precipitation" refers to the **simultaneous addition of alkaline silicate solution and acid** (page 3, lines 5-8 and 18 of the specification). In a precipitation at constant alkali number, the concentration of freely available alkali ions is kept constant (specification, page 3, lines 6-8). This means that the **pH becomes lower** during the precipitation (specification, page 3, lines 15-18).

However, in Chevallier, the **pH is constant** during the precipitation as shown in the Examples, in particular Example 1, at col. 5, lines 11-14:

> The simultaneous introduction of the acid and the silicate was carried out in a manner such that the pH of the reaction medium during this period was equal to 7.5±0.1.

Accordingly, Chevallier discloses precipitations at **constant pH** and **not at constant alkali number** as claimed.

Of course, in order to keep the pH constant it has to be brought to a certain value before the precipitation, in other words, before the simultaneous addition of silicate solution and acid. This happens in Chevallier by adding acid before the precipitation (col. 5, lines 6-9). After the simultaneous addition of silicate and acid, the pH is lowered in Chevallier to stop all other reactions (col. 2, line 12 and col. 5, lines 16 and 17). However, the change of pH before and after the simultaneous addition of silicate and acid in Chevallier are not part of the precipitation

(simultaneous addition) itself. Thus, all three steps cannot be combined as apparently done by the Examiner (Office Action of September 13, 2005, pages 3 and 4).

In summary, the methods described in Chevallier and in the present invention are fundamentally different precipitation methods. The two methods must necessarily lead to different products. Thus, the product of Chevallier cannot have the claimed choline chloride absorption and the ratio of DBP/choline chloride absorption.

THE DEPENDENT CLAIMS

Claim 4

Claim 4 is separately patentable because Chevallier fail to disclose or suggest a precipitated silica having a modified Sears number of from at least 20 to 45. Thus, the precipitated silica of Claim 4 is not disclosed or suggested.

Claim 5

Claim 5 is separately patentable because Chevallier fail to disclose or suggest precipitated silica having a combination of a BET surface area of 180-210 m^2/g, a DBP adsorption of 280-450 g/100g, and a CTAB surface area of 130-200 m^2/g. Thus, the precipitated silica of Claim 5 is not disclosed or suggested.

In Chevallier, the BET is 60 to 130 m^2/g and not 180-210 m^2/g, as claimed. See the abstract. The DOP of Chevallier is at most 270 ml/100g (col. 3, lines 4-6), there is no DBP of 280-450 g/100g as claimed.

Claim 11

Claim 11 is separately patentable because Chevallier fail to disclose or suggest a process as claimed, wherein the alkali number is at least 15. Thus, the process of Claim 11 is not obvious over Chevallier.

Claim 12

Claim 12 is separately patentable because Chevallier fail to disclose or suggest the process as claimed, further comprising the addition of an electrolyte prior to or during the simultaneous addition of aqueous silicate solution and Lewis and/or Brønsted acid. Thus, the process of Claim 12 is not disclosed or suggested.

Claim 14

Claim 14 is separately patentable because Chevallier fail to disclose or suggest a method, comprising: contacting the precipitated silica of claim 1 with a feed additive, a chemical intermediate, or a laundry detergent component. There is simply no disclosure in Chevallier of combining precipitated silica with a feed additive, a chemical intermediate, or a laundry detergent component.

Claim 15

Claim 15 is separately patentable because Chevallier fail to disclose or suggest a method, comprising: contacting the precipitated silica of claim 1 with formic acid, propionic acid, lactic acid, phosphoric acid, choline chloride solution, a plant extract, a melamine resin, a coatings additive, a fragrance, or a detergent. Thus, the method of Claim 15 is not obvious over Chevallier.

Claim 16

Claim 16 is separately patentable because Chevallier fail to disclose or suggest an elastomer, plastic, battery separator, toothpaste, catalyst support or flocculation assistant, comprising: the precipitated silica of Claim 1. Thus, the product of Claim 16 is not obvious over Chevallier.

Claim 18

Claim 18 is separately patentable because Chevallier fail to disclose or suggest the process of claim 17 wherein the alkali number is at least 15. Thus, the process of Claim 18 is not disclosed or suggested.

Claim 19

Claim 19 is separately patentable because Chevallier fail to disclose or suggest the process of claim 17, further comprising the addition of an electrolyte prior to or during the simultaneous addition of aqueous silicate solution and Lewis and/or Brønsted acid. Thus, the process of Claim 19 is not disclosed or suggested.

Claim 22

Claim 22 is separately patentable because Chevallier fail to disclose or suggest the process of Claim 10, wherein said filtering of said acidified mixture is performed. Thus, the process of Claim 22 is not disclosed or suggested.

Claim 23

Claim 23 is separately patentable because Chevallier fail to disclose or suggest the process of Claim 22, wherein said drying of said filtered precipitated silica is performed. Thus, the process of Claim 23 is not disclosed or suggested.

Claim 24

Claim 24 is separately patentable because Chevallier fail to disclose or suggest the process of Claim 17, wherein said filtering of said acidified mixture is performed. Thus, the process of Claim 24 is not disclosed or suggested.

Claim 25

Claim 25 is separately patentable because Chevallier fail to disclose or suggest the process of Claim 24, wherein said drying of said filtered precipitated silica is performed. Thus, the process of Claim 25 is not disclosed or suggested.

Thus, Claims 1, 4-5, 10-12, 14-19 are Not Obvious over Chevallier within the meaning of 35 U.S.C. §103(a).

VIII. CONCLUSION

For the above reasons, it is respectfully requested that the rejection still pending in the Final Office Action be REVERSED.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon
Kirsten A. Grueneberg, Ph.D.
Registration No.: 47,297

Customer Number
22850

PHONE NO.: (703) 413-3000
FAX NO.: (703) 413-2220
NFO:KAG

CLAIMS APPENDIX

1. A precipitated silica having the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

4. The precipitated silica of Claim 1, having a modified Sears number of from at least 20 to 45.

5. The precipitated silica of Claim 1, having a BET surface area of 180-210 m^2/g, a DBP adsorption of 280-450 g/100g, and a CTAB surface area of 130-200 m^2/g.

10. A process for preparing precipitated silica, comprising:

simultaneously metering into an aqueous silicate solution more aqueous silicate solution and a Lewis and/or Brønsted acid to provide a mixture,

acidifying the mixture to a pH of 7-3.0 to provide an acidified mixture,

optionally filtering the acidified mixture to obtain a filtered precipitated silica,

optionally drying the filtered precipitated silica,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 1, and

wherein said silica has the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

11. The process of claim 10, wherein the alkali number is at least 15.

12. The process of claim 10, further comprising the addition of an electrolyte prior to or during the simultaneous addition of aqueous silicate solution and Lewis and/or Brønsted acid.

14. A method, comprising:

contacting the precipitated silica of claim 1 with a feed additive, a chemical intermediate, or a laundry detergent component.

15. A method, comprising:

contacting the precipitated silica of claim 1 with formic acid, propionic acid, lactic acid, phosphoric acid, choline chloride solution, a plant extract, a melamine resin, a coatings additive, a fragrance, or a detergent.

16. An elastomer, plastic, battery separator, toothpaste, catalyst support or flocculation assistant, comprising:

the precipitated silica of Claim 1.

17. A process for preparing precipitated silica, comprising:

simultaneously metering into a vessel an aqueous silicate solution and a Lewis and/or Brønsted acid to provide a mixture,

acidifying the mixture to a pH of 7-3 to provide an acidified mixture,

optionally filtering the acidified mixture to obtain a filtered precipitated silica,

optionally drying the filtered precipitated silica,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 1, and wherein said silica has the following physicochemical characteristics:

BET surface area	from 50 to 700 m^2/g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m^2/g; and
DBP/choline chloride absorption	less than 1.07.

18. The process of claim 17 wherein the alkali number is at least 15.

19. The process of claim 17, further comprising the addition of an electrolyte prior to or during the simultaneous addition of aqueous silicate solution and Lewis and/or Brønsted acid.

22. The process of Claim 10, wherein said filtering of said acidified mixture is

performed.

23. The process of Claim 22, wherein said drying of said filtered precipitated silica is performed.

24. The process of Claim 17, wherein said filtering of said acidified mixture is performed.

25. The process of Claim 24, wherein said drying of said filtered precipitated silica is performed.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.